



Saving Lives and Property Through Improved Interoperability

Post-Symposium Support Report— Portland, Oregon

FINAL

July 2002

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1. INTRODUCTION

The Public Safety Wireless Network (PSWN) Program sponsored the Portland Symposium June 4, 2002, through June 6, 2002. The symposium was hosted by the City of Portland, the Oregon State Police (OSP), and the Oregon Department of Administration. Previously, the PSWN Program sponsored similar symposiums in Charlotte, North Carolina; Harrisburg, Pennsylvania; Sacramento, California; Boston, Massachusetts; Chicago, Illinois; Mesa, Arizona; Denver, Colorado; Lansing, Michigan; Orlando, Florida; St. Louis, Missouri; Honolulu, Hawaii; Boise, Idaho; Minneapolis, Minnesota; Las Vegas, Nevada; and Charleston, South Carolina. The three-day conference was composed of panels and group discussions addressing many of the technical, political, and financial issues challenging interoperability today.

This report provides a detailed summary of the events of the Portland, Oregon, PSWN Program Symposium. It is designed to be a historical resource for those who attended the symposium and to provide a broad overview for those who were unable to attend. In general, this symposium report highlights—

- Key presentations and panels discussed during the symposium
- Interoperability challenges and success stories that were discussed throughout the symposium
- Important facts and information that were provided to the audience.

The remainder of this report consists of 18 sections addressing the topics of each panel discussion and presentation at the symposium.

2. SYMPOSIUM TOPICS

The information on each topic area presented in this section was provided through presentations and panel discussions from members of the public safety community and the PSWN Program representatives. The topics were selected to give the symposium attendees a perspective on the PSWN Program and efforts to improve communications interoperability. The topics covered are listed below:

- Welcome and Keynote Addresses
- The PSWN Program Update and Public Safety Wireless Interoperability National Strategy (Public Safety–WINS) Video Presentation
- Washington State Interoperability Executive Committee (SIEC)
- Project SAFECOM—The Office of Management and Budget’s (OMB) E-Government Wireless Networks Initiative
- Utah Communications Agency Network (UCAN) and the 2002 Winter Olympic Games
- Crossing Borders—Coordinated Efforts to Achieve Interoperability Across Jurisdictions
- Michigan’s Public Safety Communications System (MPSCS)
- Vendor Panel: Can Commercial Services Meet the Public Safety Community’s Demand?
- Criminal Justice Information System/Wireless Application Test Program Update
- Regional Approaches to Interoperability—Lane Council of Governments (LCOG)
- City of Portland, 800 Megahertz (MHz) Trunked Radio System
- Spectrum Issues—The Federal Communications Commission (FCC)
- Project 25
- Association of Public-Safety Communications Officials (APCO) Project 39
- Public Safety Panel: Interference Issues
- Grants and Funding
- Regionalization Through Technology—A Computer-Aided Dispatch Case Study

- Next Symposium State Presentation and Invitation—Atlanta Police Department, Georgia (October 2002)

The following sections present each topic, supported by the remarks of the presenters.

2.1 Welcome and Keynote Remarks

At the Portland Symposium, 180 public safety officials from around the country assembled to discuss various topics relating to public safety wireless communications interoperability. Superintendent Ron Ruecker, OSP, and Chief Ed Wilson, Fire Chief of the Portland Fire Bureau (PFB), provided welcome remarks. Congressman David Wu (Democrat, OR) and Senator Ron Wyden (Democrat, OR) made the keynote addresses.

Superintendent Ruecker welcomed the PSWN Program and the symposium attendees to Portland on behalf of the Governor's office. He stated that communications interoperability was a challenge in the State of Oregon but was also mission critical for both the public safety community and the community as a whole. He closed by saying that Oregon was on the crest of the communications interoperability wave and was moving forward.

Chief Wilson also welcomed the PSWN Program and the symposium attendees to Portland on behalf of Mayor Vera Katz. He remarked that it was standard operating procedure for the PFB to conduct a debriefing after all major incidents. Two issues resurfaced consistently—communications, and command and control. Chief Wilson said that post September 11, the emphasis in the Portland region was on improving communications interoperability, where voice and data systems operated in the ultra high frequency (UHF) and very high frequency (VHF) bands, so that additional public safety agencies could achieve interoperability.

Ms. Ann Richards (Director of Communications, Congressman David Wu) stated that Congress Wu regretted that he was unable to attend the Portland Symposium because of his legislative schedule in Washington, DC. She went on to describe her firsthand experience with limited public safety communications. She explained to the attendees that she had lived in a remote area of Oregon, where the only means of communication was a battery-operated two-way radio with two channels. The radio was used for two reasons—to notify the U. S. Forestry Service of a fire or if there was a life-threatening situation. Ms. Richards then introduced Congressman David Wu (D-OR) on videotape to deliver the first keynote address.

Congressman Wu began his address by commending the Oregon hosts for bringing the symposium to Portland. He stated that public safety officials had always served America selflessly but that post September 11, public safety officials' jobs became even more critical. Police, fire fighters, and all emergency first responders were on the front lines in New York City and Washington, DC, fighting to save lives and to make America a better place.

Congressman Wu continued by saying that since September 11, everyone had a heightened sense of the role of public safety first responders and a keen awareness of the need to provide our first responders with top-quality communications equipment. He then provided an example, stating that it was the need for seamless communications that prompted the effort to upgrade the Columbia 9-1-1 Caller Center to current technology standards. Congressman Wu said he was pleased to have assisted in procuring federal support for Columbia County, which now had the

communications infrastructure that would keep the county's public safety personnel in contact with each other and the citizens of Columbia County.

In addition, Congressman Wu said, it was necessary to recognize important communications challenges, such as interference and limited spectrum for public safety. He said he had urged the FCC to take an active role in addressing these challenges.

He closed by advocating a regional approach to developing communications capabilities, pointing out that manmade and natural disasters respected no boundaries. For that reason, public safety officials must be able to communicate and work alongside neighboring jurisdictions. Congressman Wu thanked the participants for gathering in Portland to address such a crucial issue.

Mr. Jason Daughn (Staffer, Senator Ron Wyden) thanked the PSWN Program and the Oregon agencies that co-hosted the symposium. He then introduced Senator Ron Wyden (D-OR) on videotape to deliver the second keynote address.

Senator Wyden thanked the group for providing the opportunity for him to speak at this public safety symposium. He pointed out that the symposium was about more than the "gadgets and gizmos" that allowed response agencies to communicate. He said the participants had gathered because they knew that public safety communication systems might literally save American lives tomorrow.

As a member of the United States Senate and Chairman of the Senate Subcommittee on Science, Technology and Space, Senator Wyden said he had spent numerous hours since September 11 looking at the Nation's response to and readiness for another assault. He added that firefighters, police, and first responders from all around the country had convinced him that communications interoperability was the pillar of preparedness. In addition, the Subcommittee had conducted four hearings on ways to mobilize America's scientific and technology experts to fight terrorism. Senator Wyden said the Subcommittee had recommended the formation of a volunteer core of technology experts establishing the National Emergency Technology (NET) Guard. NET Guard volunteers would arrive on the scene at a moment's notice to assist first responders with technology challenges at disaster sites. NET Guard became part of the Science and Technology Emergency Mobilization Act introduced by Senator Wyden and Senator George Allen (D-VA).

Senator Wyden continued by saying that prior to September 11, achieving communications interoperability was not high on the priority list of most lawmakers and public safety officials—however, now there was a heightened sense of awareness to the challenges that public safety officials faced on a daily basis. He reported that in Senate hearings, Chief Ed Plaughner (Fire Chief, Arlington County Fire Department) testified that on September 11, people were using handwritten notes to communicate at the Pentagon because it was the most reliable means of communication. Chief Plaughner also said public safety needed communications systems that operated seamlessly when seconds count. Senator Wyden added that Mr. Jim Allbaugh (Director, Federal Emergency Management Agency [FEMA]) testified that achieving interoperability would make the biggest difference in our country's ability to respond in a crisis.

In closing, Senator Wyden said the Nation must use its extensive resources and technological advances to achieve communications interoperability at the local, state, and federal levels.

2.2 The PSWN Program Update and Public Safety Wireless Interoperability National Strategy (Public Safety WINS) Video Presentation

Mr. Bob Lee, PSWN Program Manager from the Department of Justice (DOJ), provided an overview of the critical challenges to improving interoperability. He began by stating that wireless communications interoperability was necessary to improve the ability of the public safety officers to save lives and property, facilitate rapid and efficient interaction among all public safety organizations, and provide immediate and coordinated assistance in day-to-day missions, task force operations, and mass casualty incidents. He added that the events of September 11 had highlighted the necessity for effective public safety operations.

Mr. Lee emphasized that the ability to communicate heavily impacted the effectiveness of public safety first responders. He reported that an analysis compiled by the PSWN Program of communications at the Pentagon following the terrorist attack showed—

- No means of direct interoperability was immediately available between local, state, and federal responders.
- Commercial service networks, with some exceptions, were not capable of handling the immense volume of calls generated at or near the incident site. Private land mobile radio (LMR) systems were the most reliable form of communications.
- Public safety agencies at all level of governments lacked priority access to commercial systems.
- Large regional and statewide systems could help an increase in radio traffic.

Ultimately, Mr. Lee said, effective communications was a key component of homeland security. The ability to communicate was important in saving lives and protecting property because it made possible incident command and control, dissemination of information in real time to areas in need, improvement in evacuation coordination, and reduction in casualties.

Mr. Lee then described the PSWN Program and what it was doing to improve public safety wireless communications interoperability. For further information on the program, visit the program's Web site at www.pswn.gov.

2.3 Washington State Interoperability Executive Committee (SIEC)

Mr. Clark Palmer (Division Manager, Washington State Patrol) began his presentation by stating that public safety agencies at all levels of government required communications interoperability in both routine and emergency operating environments. He said the Washington State SIEC was established to—

- Monitor public safety agencies' need to upgrade, expand, and enhance voice and data wireless capacity

- Provide the access public safety and justice agencies need to communicate with other state, local, or federal wireless systems
- Provide policy guidance and direction regarding wireless voice and data system development.

In addition, Mr. Palmer said, the SIEC was intended to serve as a centralized forum to address wireless interoperability issues and encourage development and modification of systems (e.g. voice and data) within a state. The central objectives of SIECs were to promote systems development that maximized economies of scale and to initiate consolidated procurement and maintenance activities. He pointed out that the FCC had also made formation of an SIEC, or its equivalent, a prerequisite for states wanting to obtain licenses for the 2.4 MHz of spectrum designated for state licensing on the 700 MHz band.

Mr. Palmer listed a number of lessons learned from Washington State's experience in forming an SIEC:

Lessons Learned
<ul style="list-style-type: none"> • Discussions take place in the different “languages”: policy level, technical detail, and executive level (find and use experts in each area) • SIEC creation and maintenance is resource intensive • Issues will arise: SIEC membership turnover, changing priorities, funding constraints, turf wars, etc. • It has taken decades to create the problem; it will not be fixed in a week • Looking for common ground as the basis for all discussions is key • A communication plan is critical to preserve the momentum • Continuous education and outreach is required for success • Policy-level representation is needed on the committee

Mr. Palmer stressed the need to establish subcommittees to carry out the actual technical work and preserve the momentum, and that these subcommittees must have the authority to meet regularly. He cited the current Washington State SIEC director's policy of having a deliverable for every two of these meetings to show tangible work product versus mere discussion. Mr. Palmer closed by saying that continual outreach was a key component of success, as were scalability, increasing the scope of SIEC activities, the experience base, participation, and challenges regarding SIEC activity.

2.4 Project SAFECOM—The Office of Management and Budget's (OMB) E-Government Wireless Networks Initiative

Mr. Tom Wiesner (Director, Wireless, Department of the Treasury) began by noting that OMB was working with Chief Information Officers (CIO) across the Federal Government in supporting 24 E-Government initiatives to improve services and operations, and realize savings. He said the initiatives were in one of four categories—

- Government to Government (G2G)—i.e., e-grants, e-vital statistics
- Government to Citizen—i.e., e-filing of income tax, access to loans
- Government to Business—i.e., small business compliance

- Internal Operations

Mr. Wiesner explained that as one of the 24 E-government initiatives, Project SAFECOM's goal was to accelerate the implementation of interoperable public safety wireless communications at all levels of government. He said Project SAFECOM was a G2G initiative that would focus on the implementation of narrowbanding, interoperability, and other critical improvements to the wireless communications systems. He added that the program was designed to improve the readiness of public safety wireless systems for homeland security and traditional public safety response for federal agencies.

Mr. Wiesner pointed out that homeland security was having a significant impact on how all public safety agencies did business. Recent events had blurred the lines between public safety and national security, and had thrust federal entities into broader public safety roles, heightening the need for federal public safety providers to directly communicate with one another and with their state and local counterparts. He indicated that wide-area interoperability within regions was needed and would now likely include communications with nontraditional players such as stateside military installations and the National Guard. He expressed the belief that homeland security efforts were renewing the spirit of sharing information and resources across government entities.

Mr. Wiesner closed by explaining that the government CIOs board would provide SAFECOM project oversight, FEMA would be the managing partner, and Mr. Tom Ringer (Homeland Security Coordinating Officer, Office of the Chief Information Office, FEMA) would serve as Program Manager.

2.5 Utah Communications Agency Network (UCAN) and the 2002 Winter Olympic Games

Chief Gary Whatcott (South Jordan City Fire Department and Chairman, UCAN Executive Committee) and Mr. Proctor (Executive Director, UCAN and PSWN Executive Committee member) provided a presentation on UCAN and its role in supporting the 2002 Winter Olympic Games in Salt Lake City. Chief Whatcott began by explaining that the State of Utah formed the UCAN as a quasi-state agency to serve as a board of directors for the development of a public safety communications system.

Chief Whatcott then related the history and some details about the system. In 1998, when it was purchased, it was Motorola's largest "Smart" system. In response to the financial restrictions imposed on some of the more than 55 UCAN participants, the system incorporated both analog and digital capabilities. UCAN was the radio infrastructure provider, and 16 dispatch centers were interconnected with the management structures. He said the system, which was completed in 2001, was a Motorola SmartZone and now served as a model for developing and maintaining effective multiagency partnerships to improve interoperability.

Mr. Proctor continued by presenting operational statistics and lessons learned at the 2002 Winter Olympic Games in Salt Lake City. He explained that the 800 MHz system built to support the Games was completed in 36 months; used 43 UCAN sites, 20 Olympic sites, and 16 emergency 911 centers; and involved 91 agencies. He said the system demonstrated definitively that it could handle large events—approximately 7,000 radios were used over a 17-day period. Interoperability was achieved using system-to-system patches through consoles, with the PSWN Program providing base interface module (BIM)-to-BIM patches for federal-to-state-to-local

coverage. He added that communications also involved unit-to-unit simplex (state and national), stand-alone repeaters, operations channels (trunked), regional channels (trunked countywide), and event channels (trunked system wide).

Mr. Proctor listed several lessons learned from the Olympic Games experience:

Lessons Learned
<ul style="list-style-type: none"> • Hard work and planning pays to ensure those public safety agencies supporting the 2002 Winter Olympics could talk to one another. • Site preparation, backup power, and generators were worth the expense so that communications would remain seamless throughout the event. • The radio coverage during the Olympics actually met the coverage design plan. • The BIM-to-BIM patches successfully provided the interconnect between agencies on other systems. • Talk groups must be managed to distribute system loading. • Event channels provided necessary agency interoperability. • UCAN was surprised that all radios did not have interoperability channels. • <i>Ongoing training is necessary.</i> • System watch and alarms were vital to system management. • UCAN provided not only “outside the fence, but inside the fence communications.” During the Games, only 28 maintenance tickets were filed with the Salt Lake Olympic Committee Technical Coordination Committee.

Mr. Proctor closed by stating that UCAN managed the implementation, and now managed the operation of this shared regional system that supported public safety communications during the Games. He said that Utah’s Olympic legacy was this radio system.

2.6 Crossing Borders—Coordinated Efforts to Achieve Interoperability Across Jurisdictions

This panel identified communications issues experienced when crossing jurisdictional boundaries. The panelists gave their field perspectives and described the solutions they used to overcome interoperability challenges. Mr. Mike Zanon, Chief Information Officer, OSP, and panel moderator, explained that the panel members represented the practitioners on the frontlines of their respective agencies. Their primary concerns were limited to knowing that when the mike was keyed that they were able to communicate with someone. The panelists contributed the following information:

- Assistant Chief Max Santiago (Assistant Division Commander, Information Management Division, California Highway Patrol [CHP]) stated CHP had a \$1 billion operating budget, 5,000 sworn officers, and 10,000 employees. He explained that CHP’s responsibilities included reducing the number of people killed, enforcing laws, providing security for the Governor, supporting homeland security, and investigating incidents at dams and bridges. Assistant Chief Santiago described CHP’s current radio system as using the 150 MHz band with mutual aid, audio patch, and 26 communications centers to support operations in 58 counties. Interoperability with other agencies consisted of monitoring police scanners, and therefore, if public safety agencies migrated to a trunked radio system, the CHP would not be able to listen by

scanner. Assistant Chief Santiago recommended establishing good policies and using standard language.

- Sergeant Rod Lucich (Portland Police Bureau) described the Portland Police Bureau's system as an 800 MHz Motorola SmartZone Type II analog system that was an asset to the law enforcement community. He explained that the primary responsibilities of the Portland Police Bureau were enforcement and special events, which require the most communications. Sergeant Lucich stated that conversion from conventional to trunked systems presented several challenges including developing a common radio language and providing appropriate training on the differences between the two technologies. He said interoperability between the Portland Police Bureau and other public safety agencies was currently achieved by one agency telephoning another.
- Lieutenant Travis Hampton (Patrol Division, OSP) stated that OSP was a full-service police agency. He said its radio system used highband repeaters and had two communications centers. Lieutenant Hampton said OSP experienced radio interference from agencies that used 800 MHz systems. He said OSP had no regular communications interoperability with local law enforcement agencies. One means used to achieve communications interoperability when needed was by actually placing an officer in the assisting agency's vehicle or by using a commercial services solution (i.e., Nextel cellular telephone). He added that other agencies also shared their handheld radios with OSP to achieve communications interoperability.
- Captain Lee Graham (Enforcement Operations, Multnomah County Sheriff's Office [MCSO], Oregon) stated that the MCSO patrolled rural areas and 100 miles of waterways. He said they used an 800 MHz system with several talk groups. Communications interoperability was sometimes achieved by radio exchange with other agencies, but there was no common language. Captain Graham said that communications interoperability was also achieved by console-to-console patch. He reported that most of the agencies that coordinated and partnered with MCSO were small locales with limited budgets, which prevented them from keeping up with technology. Finally, he said that MCSO had no interoperability with federal agencies.

The statements of the panelists illustrate the complexity of achieving communications interoperability across jurisdictions.

2.7 Michigan's Public Safety Communications System (MPSCS)

Captain Tom Miller, Director, Communications Division, Michigan State Police, discussed the challenges and successes in planning and developing the MPSCS. He said the State of Michigan had been a leader in the development of statewide systems for years. The Michigan State Police served as the lead agency in developing a digital, trunked, Project 25-compliant, 800 MHz system for use by all state agencies and interested federal agencies and local governments. The primary vendor for the system was Motorola. The key feature of the system was that it provided intra-agency interoperability statewide. Captain Miller stated that Michigan was funded to provide the infrastructure, while federal and local agencies that wanted to participate on the system provided the end-user equipment. He reported that the system was costing the state approximately \$200 million.

Captain Miller said Michigan's system was being developed in four phases. The first three phases were complete, and 120 tower sites were operational. He indicated that phase four covered the upper east and west peninsula of Michigan and that 61 towers were under construction. He reported that the system currently had more than 64,000 user identifications and 16,000 talk groups on all levels of government. Captain Miller stated that new participants discovered the benefits of a shared system and incurred only minimal cost to use the backbone of the statewide system. He said that the final phase would be completed by the end of 2002. Captain Miller provided the following lessons learned from Michigan's experience:

Lessons Learned
<ul style="list-style-type: none"> • A solid contract is critical to protect all stakeholders interest. • User expectations must be managed. • Field beta test was desirable, if possible. • People make the project. • Communication inside and outside the Project Team is essential. • There must be a focus on training.

For more information on the Michigan system, visit its Web site at www.mpscs.com.

2.8 Vendor Panel: Can Commercial Services Meet the Public Safety Community's Demand?

This panel discussed the ability of commercial services to support the public safety mission. Key issues important to the public safety community at large were discussed. Mr. Rick Murphy (PSWN Program Manager/Treasury) served as moderator. He began by asking each vendor to provide a description of the product line for the public safety community.

The following questions were asked:

1. What is being done to make your products more user friendly in encrypted mode? (i.e., over-the-air rekeying)
2. What success have you had achieving interoperability in dissimilar systems?
3. For the Nextel representative: Are you considering providing nationwide direct connect?

M/A-COM		Dr. Ernie Hofmeister
<i>Product(s)</i>	<ul style="list-style-type: none"> • NetworkFirst 	
<i>Description</i>	<ul style="list-style-type: none"> • Produce conventional and trunked radio systems • NetworkFirst components: SkyGate and SkyCenter • SkyGate converts audio from interconnected radio systems to Internet Protocol (IP) packets and sends to central SkyCenter hub • SkyCenter hub serves as an IP voice switch and switches calls among SkyGates 	
<i>Benefits and Drawbacks for Public Safety and Interoperability</i>	<ul style="list-style-type: none"> • Provides a wide area interoperability solution linking existing disparate public safety LMR networks and connecting users operating within their home network coverage areas • Offers universal connectivity through a public switched telephone network (PSTN) connection • As IP-based system, allows substantial scalability capable of incorporating continuing advancements in IP and commercial off-the-shelf products • Enhanced Digital Access Communications System, which allowed the user to interact with one or more public safety communications systems for the exchange of voice information according to a prescribed manner and procedure 	
Motorola, Inc.		Bill Fivek
<i>Product(s)</i>	<ul style="list-style-type: none"> • Radio system life-cycle management services 	
<i>Description</i>	<ul style="list-style-type: none"> • Produce conventional and trunked radio systems • Implementation, technical, and management consulting services 	
<i>Benefits and Drawbacks for Public Safety and Interoperability</i>	<ul style="list-style-type: none"> • Manages risks of increasing costs of ownership through effective life-cycle planning for systems development • Integrates interoperability needs, appropriate financial models, replacement costs, and other key management needs into system life-cycle plans • Motorola's equipment is proprietary 	
Nextel Communications, Inc.		Kathy Romeo
<i>Product(s)</i>	<ul style="list-style-type: none"> • Nextel nationwide cellular voice and data network service 	
<i>Description</i>	<ul style="list-style-type: none"> • Nationwide cellular coverage and PSTN connectivity • Two-way radio and talk group capabilities, as well as wireless data services 	
<i>Benefits and Drawbacks for Public Safety and Interoperability</i>	<ul style="list-style-type: none"> • Provides two-way radio interconnect between members of a talk group in any area of the country • Supplements existing wireless voice and data capabilities of "private" public safety LMR networks and can help reduce the number of required channels, capital costs, and maintenance costs • Grants priority access within Nextel system • No interoperable equipment 	

EF Johnson Company		Jim Holthaus
<i>Product(s)</i>	<ul style="list-style-type: none"> • 100 percent compatibility with Motorola's SMARTNET/SmartZone trunked radio systems • Netelligent voice over IP solution integrates APCO Project 25 and Internet-based technological standards • Multi-Net II System 	
<i>Description</i>	<ul style="list-style-type: none"> • Produce conventional and trunked radio systems 	
<i>Benefits and Drawbacks for Public Safety and Interoperability</i>	<ul style="list-style-type: none"> • Multi-Net II system offers a full set of features for the public safety market. These features include an emergency system access switch, the ability to set priority levels, priority queuing, and the ability to operate in the conventional mode if the need arises. All EF Johnson Multi-Net II systems follow the technical guidelines documented in the APCO 16 standard 	
ICOM America, Inc.		Chris Lougee, Vice President
<i>Product(s)</i>	<ul style="list-style-type: none"> • ICOM has a wide range of UHF radios 	
<i>Description</i>	<ul style="list-style-type: none"> • Produce conventional radio systems with trunking capability 	
Relm Wireless		Devra Herlin
<i>Description</i>	<ul style="list-style-type: none"> • Produce conventional radio systems capability 	
Thales Communications, Inc.		Steve Nicholas, Manager, Project 25 Marketing
<i>Product(s)</i>	<ul style="list-style-type: none"> • Portable handheld Project 25 digital compatible with wideband and narrowband analog systems 	
<i>Description</i>	<ul style="list-style-type: none"> • Produce conventional radio systems capability 	

2.9 Criminal Justice Information System/Wireless Application Test Program (WATP) Update

Mr. Jerry Marco (Management Analyst, Federal Bureau of Investigation [FBI]) began by describing WATP as a program for testing wireless data applications for use by the public safety community when accessing the National Crime Information Center (NCIC). He stated the NCIC was created by the FBI in 1967 to help criminal justice agencies improve their operations by providing a nationwide information system to support investigations.

Mr. Marco said NCIC provided many features including fingerprint images, enhanced name searches, probation and parole lists, online manuals, improved data quality, information linking, mug shots, other images (e.g., vehicles, boats, or vehicle and boat parts), convicted sex offender lists, access to SENTRY (an index of individuals incarcerated in the federal prison system), delayed inquiry, and an online ad-hoc inquiry.

Mr. Marco said the PSWN Program had worked in conjunction with WATP to evaluate the feasibility of integrating NCIC into various mobile data communications systems. This joint effort assessed the reliability and ease of use of the NCIC hardware and software in different wireless environments. The program also assisted in developing guidelines for interface to various wireless communications and increased liaison support between local, state, and federal criminal justice agencies on mobile data communications.

2.10 Regional Approaches to Interoperability—Lane Council of Governments (LCOG)

Two representatives of the LCOG presented details on how the LCOG regional partnership had created the Public Agency Network. Mr. Cress Bates (Phase II Wireless Implementation Geographic Information System [GIS] Principal, LCOG) began by stating that among the many services LCOG provided was regional technology services coordination, including strategic planning. He said a major accomplishment of the regional partnership was creation of the Public Agency Network, which provided a structure for local agencies to share high-bandwidth, fiber-optic resources. Mr. Bates described the system as a data-based GIS that was primarily used for crime analysis, emergency map location, and analysis of station coverage overlap and gaps. He closed by explaining that the system provided area-wide information and acted as a record system. He added that the system also served as a community emergency notification system.

Mr. Byron Vanderpool (Regional Technology Services Coordinator, LCOG) continued the presentation by discussing the regional fiber optic consortium. The consortium, a public-private partnership, was organized to conserve fiber and cost, and provided for agency data separation along the network. Mr. Vanderpool said the consortium consisted of two cities, a county, two public utilities, three school districts, one community college, one university, and one transportation district. He described the effort it took to create such a consortium—a willingness to cooperate, strong leadership, a strong need, a reasonable technical solution and savvy technical staff, and an intergovernmental agreement. Mr. Vanderpool reported that within the first year, two goals had been achieved. He added that currently, there were other agencies seeking to join the network.

2.11 City of Portland, 800 Megahertz (MHz) Trunked Radio System

Ms. Nancy Jesuale (Director, Communications and Networking, City of Portland) began her presentation by stating that Portland's 800 MHz system allowed more than 100 public safety, utility, public service organizations, and other qualifying entities within the coverage area to communicate directly with each other, as well as with 800 MHz SmartZone systems in Clark, Clackamas, and Washington counties. The system also offered "smart patches" to neighboring public safety and public service agencies' VHF and UHF systems. The presentation described the Portland radio system and its integration with the city's information technology system and fiber network infrastructure. It also described the Internet Protocol over routing domain-link access procedure development and Portland's unique total communications enterprise, ComNet, which owned, operated, and maintained these diverse communications resources. The following table provides additional highlights of Ms. Jesuale's presentation.

City of Portland's Public Safety Radio System	
Marketing Program	<ul style="list-style-type: none">• ComNet operates as an "enterprise bureau"• Rates are currently about \$32/month for unlimited access (voice or data device)• Users sign a five-year contract• Rates are adjusted every two years
System Participation	<ul style="list-style-type: none">• 88 public safety agencies/federal/state/local agencies• 135 daily talk groups on an average simulcast system• 10,140 active two-way radios• 568 mobile data terminals• Interoperability among all of them

City of Portland's Public Safety Radio System	
Smart Patches	<ul style="list-style-type: none"> • Support communication between earlier radio systems during upgrades • Support seamless communications between multiple agencies on different radio systems • Allow multiple agencies (i.e., federal, state, local) to talk to each other on multiple systems • Provide 25 separate interoperability "smart patches" • Connect Clark County and Washington County 800 MHz systems • Include patches to City of Lake Oswego, National Public Safety Planning Advisory Committee (NPSPAC) channels, Oregon Department of Transportation, Oregon State Police, Oregon State Fire Net, U.S. Forest Service (Mt. Hood District)
Infrastructure	<ul style="list-style-type: none"> • ComNet Network Operations Center (7 days a week, 24 hours a day) • ComNet Operations and Maintenance Shop • Maintenance, Install, and Repair Facility (the shop) • 14 zones—4 simulcast sites with 10 Intelligent Repeater sites • 24-channel simulcast • 9 dispatch centers, 34 consoles • 10 full-time technical staff • DS-3 loop microwave interconnect • Fiber-optic interconnects • Self maintained • Self engineered • 7-layer redundancy • Excellent performance record
Portland Wide Area Architecture— Motorola SmartZone Interoperability	<ul style="list-style-type: none"> • SmartZone switch—transparent roaming • Trunked simulcast cells • Low density trunking cell (Biddle Butte) • Conventional channel cell (OSP, State Fire, National Oceanic and Atmospheric Administration, etc.) • High density trunking cell (Waters Hill) • Integrated wide-area network (all sites not listed)
Nextel Interference	<ul style="list-style-type: none"> • Caused steadily increasing degradation of coverage • Occupational Health and Safety Administration Complaint filed in 1999 by Portland Police Association • Led to a great deal of engineering, joint planning, communication • Replaced all system antennas • Modified all portable radios
Mobile Data System	<ul style="list-style-type: none"> • Financed by federal grant to Portland Police Department • Provides increased officer availability • Is upgrading Mobile Data Terminals • Makes mug shots available in patrol vehicles • Permits in-vehicle report writing • Uses Motorola DataTac .0 System • Has 14 base station locations • Has system utilization that is 30 percent of capacity • Includes 568 active two-way data devices • Uses Motorola MW-520s and Data 911 • Used primarily by police and fire

City of Portland's Public Safety Radio System	
Spectrum Issues	<ul style="list-style-type: none"> • Broadband wireless is essential to public safety • Need to align with ITS, utilities, and other local governments • Commercial providers cannot be responsible for public safety • Equipment manufacturers need transmit and receiver standards

2.12 Spectrum Issues—The Federal Communications Commission (FCC)

Ms. Jeanne Kowalski (Deputy Chief, Public Safety and Private Wireless Division, FCC) began by noting that there would be an FCC Public Notice shortly identifying the 33 states that had notified the Commission of their intent to use or form an SIEC-type entity to administer their state-licensed 700 MHz spectrum.

She said that the notice would permit the Regional Planning Committees to plan accordingly to support or, in the case of states that did not opt for an SIEC-type entity, to manage the spectrum as contemplated in the Third Report & Order on WT Docket 96-86.

Ms. Kowalski also highlighted the role of the four primary frequency coordinators in 700 MHz planning:

- APCO
- American Association of State Highway and Transportation Officials
- International Municipal Signal Association
- Forestry Conservation Communications Association.

Ms. Kowalski, reinforced by Mr. Rick Murphy (PSWN Program Manager/Treasury), stressed the importance of the public safety community supporting the Commission's critical decision-making process by providing comments on FCC WT Docket 00-32 regarding the allocation of 50 MHz of spectrum on the 4.9 gigahertz band to public safety use. They also emphasized the importance of public safety support in the form of reply comments addressing the issues surrounding interference to public safety systems on the 800 MHz band on WT Docket 02-55. Ms. Kowalski said both responses were due on July 8, 2002.

Ms. Kowalski closed by encouraging use of FCC online resources for learning about activities in which the public safety community could participate. Mr. David Pickeral (PSWN Program contractor support staff) added that the critical proceedings for public safety, including the PSWN Program's filings on these dockets, were summarized and tracked on the program's Web site (www.pswn.gov).

2.13 Project 25

In this presentation, Mr. Don Pfohl (Director of Communications, City of Mesa, Arizona) provided a comprehensive overview of the status of the full suite of P25 standards. He also provided attendees with a brief overview of Project MESA, a cooperative effort of the European Standards Institute, the Telecommunications Industry Association in the United States, and the U.S. and European public safety communities.

Mr. Pfohl began by explaining that P25 was a long-term standards development process that had drawn local, state, and federal public safety officials together with the goal of promoting compatibility through open standards. He noted that P25 Phase 1 frequency division multiple access standards offered several key advantages compared with other standards. For example, only P25 standards could provide coverage that approximated that provided by analog services. In addition, he said, they were the only written standards that addressed all public safety bands and enabled a planned migration path, a true direct mode capability, and scalability. Mr. Pfohl pointed out that use of P25-compliant equipment improved spectrum efficiency because it enabled recycling of spectrum.

Mr. Pfohl went on to say that Motorola was the only equipment manufacturer currently building infrastructure that met the P25 standards, but that the P25 Steering Committee was trying to change that in order to promote competition in the marketplace and give users choices. With respect to encouraging competition, Mr. Pfohl said the P25 Steering Committee advised users to define their needs and investigate technologies and manufacturers. In other words, users should consider their options and work to influence the manufacturing process—Project 25 was not the only option.

The presentation continued with an overview of Project MESA, which Mr. Pfohl described as an effort to create a standard for wideband, high-speed, ubiquitous data transmission. Project MESA technology would enable extensive mobility for emergency and safety applications.

Mr. Pfohl stated that Project MESA was sponsored by an international partner group, but that anyone could participate. In fact, the expense of Project MESA virtually required a public–private partnership that would allow participants to take advantage of technology convergence and leverage knowledge. He explained that Project MESA was an attempt to achieve a global standard, and that MESA technology would allow for movement of an unprecedented quantity of data. Mr. Pfohl said public safety providers needed to be aware of opportunities to participate in this effort so that they would have some control over the future of technology that would impact them daily.

Mr. Pfohl closed by listing some key applications for MESA technology-enabled equipment—high-speed wireless data from incident sites (i.e., with multiple transmission rates), voice command and control, airborne audio and video surveillance, electronic messaging, fingerprint and iris scanning, and the transmission of building, structural, electric, plumbing, and natural gas plans. He said Project MESA would also enable the use of Global Positioning System technology for individual and unit tracking, surveillance tracking beyond law enforcement applications, remote mapping, and medical bio-telemetry information. Finally, it would enable use of robotics for locating victims of natural or manmade disasters. Mr. Pfohl stated that, upon completion, the Project MESA standard and its associated technology were expected to reach a global market.

2.14 APCO—Project 39

Ms. RoxAnn Brown, Vice Chair, APCO Project Committee, provided a comprehensive overview of the Project 39 mission, goals, and status updates on current activities. She began by saying that in April 2000, the FCC called for the establishment of an industry task force to examine the interference issues involving commercial wireless services providers and public safety 800 MHz radio systems. She said that partners involved in exploring a solution included

representatives from public safety system operators, commercial system operators, manufacturers, and the FCC.

Ms. Brown said the initial goal of Project 39 was to have current public safety 800 MHz interference issues cataloged within six months. This effort would include recording how the problem manifested itself, who the contact parties were for the public safety agency affected, what was causing the interference, how long the interference had been occurring, and what, if anything, had been done to remedy the problem. Ms. Brown said APCO 39's next goal was to test and provide multiple, reality-based, short-term (less than 12 months), mid-term (less than 24 months), and long-term solutions for eliminating the interference problems. She explained that within 12 months, Project 39 hoped to have all potential short-term interference solutions identified, tested, and where applicable, applied. Within 18 months, the goal was to identify all mid-term and long-term solutions and, where possible, to test them.

Participants commented that the interference problem was the result of insufficient planning and rulemaking on the NPSPAC channels, and stressed that there were similar implications for the 700 MHz spectrum given the presence there of adjacent high-power commercial services as well.

Ms. Brown said the problem had to be solved through changes in the operating rules (e.g., receiver standards); a local and/or site-by-site fix would only prolong the problem or shift it somewhere else. It was simply impossible to address at the end-user level. She added that given equipment life cycles and the long timeline of FCC rulemaking procedures, this problem would potentially take 25 years to fix if it was not addressed before it actually occurred.

Participants pointed out that the decision makers were often not technicians, and that they needed to be indoctrinated on the big picture to allow them to pursue change at the policy level.

The overriding message was: "We can't wait." Oklahoma City, the events of September 11, and any number of natural disasters over the past 10–15 years have all revealed serious problems with interference on the NPSPAC channels. "These are not anomalies."

2.15 Public Safety Panel: Interference Issues

This panel built on the information gleaned from the APCO Project 39 presentation (see Section 2.14). The members of the panel discussed interference issues they had experienced in their jurisdictions. This panel was moderated by Ms. RoxAnn Brown. The following are highlights of the panel discussion:

- Mr. Joe Kuran (Technical Systems Manager, Washington County Consolidated Communications Agency) stated that research into interference issues was initiated in his jurisdiction because a fire station in Washington County experienced missed calls on its 800 MHz radio system. He went on to explain the long process required to discover the nature of the problem and to submit a complaint with the FCC, which turned into a two-year ordeal.
- Mr. Kevin Kearns (Manager of Information and Telecommunications Services, King County, Washington) said his jurisdiction experienced the same kind of problems as Washington County, but he was able to identify and quantify the most common interference issues—receiver intermodulation, receiver overload, and out-of-band emissions. Mr. Kearns told the attendees that the product of the King County effort, a six-month study and best practices guide, was available on the APCO Web site (<http://www.apcointl.org/>).
- Chief Randy Bruegman (Fire Chief, Clackamas County and First Vice President, International Association of Fire Chiefs [IAFC]), stated the underlying problem regarding these interference issues was the lack of enough secure spectrum for those on the front lines. He said that this issue brought together for the first time the incoming presidents of the IAFC, International Association of Chiefs of Police, and APCO as an inter-association task force. Chief Bruegman closed by stressing the importance of getting the FCC involved and stating that the public safety community must participate if the situation was to improve.

This panel illustrated the difficulties involved in solving interference problems and pointed out the ultimate responsibility of the FCC to find an overall solution.

2.16 Grants and Funding

Corporal Bruce Clemonds (Grants Projects Special, Missouri State Police) encouraged symposium attendees to look beyond traditional sources of public safety funding (e.g., DOJ) to others such as Department of Education and the Department of Transportation for grants to assist with public safety communications as a component of supporting these agencies' missions. He added that state and local applicants could pool grants from multiple sources to address joint communications needs.

Corporal Clemonds pointed out that online resources are valuable research and application tools as the grant process moves away from traditional paper-based activity. He added that, *several grants could only be applied for online*. Corporal Clemonds provided the following list of these online resources:

Funding Resources

<http://www.fedbizops.gov> (Federal Business Opportunities)
<http://www.firstgov.gov> (Federal Government Grants)
<http://www.ojp.usdoj.gov/BJA/> (Bureau of Justice Assistance)
<http://www.ojp.usdoj.gov/nij/funding.html> (National Institute of Justice)
<http://ojjdp.ncjrs.org/grants/grants.html> (Office of Juvenile Justice and Delinquency Prevention)
<http://www.ojp.usdoj.gov/ovc/fund/welcome.html> (Office for Victims of Crime)
<http://www.ojp.usdoj.gov/bjs/funding.htm> (Bureau of Justice Statistics)
<http://www.ncjrs.org/fedgrant.html> (National Criminal Justice Reference Service)
<http://www.usdoj.gov/cops/gpa/default.htm> (U.S. DOJ Response Center)
<http://www.opm.state.ct.us/pdpd1/grants/llebg.htm> (Local Law Enforcement Block Grants)
<http://fr.cos.com/Docs/aboutfr.shtml> (Federal Register)
<http://www.cfda.gov/> (Federal Domestic Assistance Catalog)
<http://fdncenter.org/funders/> (Foundation Center)
<http://www.cof.org/resources/grantresources/index.htm> (Council on Foundation Center)
<http://www.hud.gov/grants/index.cfm> (Housing and Urban Development [HUD] Clearinghouse)
<http://www.acf.dhhs.gov/grants.html> (National Clearinghouse on Child Abuse and Neglect Information)
http://www.pswn.gov/library/lib_funding.htm (PSWN Program)

Corporal Clemonds reported that DOJ's Community Oriented Policing Services program was anticipated to expand significantly and that current legislation in the Senate (Bill S. 924) had the potential to address interoperability in communications. He also suggested that the Technology Transfer Program was, and might increasingly be, a good, fast-turnaround source of current generation equipment.

Corporal Clemonds closed by saying that it was important to note the distinction between "hard" funds matching (e.g., for Local Law Enforcement Block Grants, which required 10 percent cash, as opposed to "soft" matching, in which in-kind service/resources could be matched based on value."

2.17 Regionalization Through Technology—A Computer-Aided Dispatch Case Study

This panel addressed the various phases in establishing a regionalized public safety information sharing system between two counties and a city within Washington State's South Puget Sound region. Panel members representing the participating agencies engaged in an interactive discussion of the process and benefits associated with "regionalization." Mr. Michael Marusich (Manager and Senior Consultant, Align 360) served as moderator. The following summarizes comments made by the panel members:

- Mr. Robert Negrete (Director and Senior Manager of Public Administration Practice, Align 360) explained the study was conducted by—
 - Looking at developing a survey to gather data and develop a request for proposals using needs assessment methodology
 - Using an intergovernmental agreement when developing the governing structure.
- Ms. Lori Ericson (Communications Manager, City of Puyallup, Washington) stated that the participating agencies requested to—
 - Retain control of system functionality
 - Minimize changes to system processes

- Share training and technical staff
- Have the ability to push callers' information from one center to another
- Ms. Laura Worley, Director, Pierce County Fire Communications, Washington) added that during the vendor selection process—
 - Various systems were demonstrated and scored to allow for user buy-in and evaluation
 - All three agencies agreed on the same system because buy-in was vital
- Mr. Marusich stated that the computer-aided dispatch center received funding from the State 911 center to determine whether the regional dispatched approach was feasible in the South Puget Sound area for three agencies. A consulting firm found that—
 - Regionalization was the most cost-effective approach
 - Maintaining local control was important
 - Regionalization required a wide area network to connect three centers
 - Improved communications interoperability was necessary

The panelists also provided the following general information about the regionalization experience:

Benefits of the Selection Process	<ul style="list-style-type: none"> • Shared cost of consultants • Dispersal of computer aided dispatch fees among the three agencies • Shared best practices and lessons learned
Constraints	<ul style="list-style-type: none"> • If an agency left the group, renegotiating and pricing would be required
Overall Benefits	<ul style="list-style-type: none"> • Regionalization has helped with technical issues and personnel issues • Regionalization does not require consolidation • Regionalization allows the three agencies to leverage technology

This panel discussion described another option for the public safety community to develop coordination and partnerships to reduce cost and share resources.

2.18 Next Symposium State Presentation and Invitation—Atlanta Police Department, Atlanta, Georgia (October 2002)

Lieutenant Virtue Hall (Atlanta Police Department) introduced two short videos about Atlanta and the State of Georgia. She stated to the audience that Atlanta was a growing metropolitan area and a major doorway to the South. She went on to explain that Atlanta's communications system was a Motorola Type II Hybrid SmartNet system. She added that the city had another separate communications system, which was independent of the SmartNet system that was deployed only during major incidents.

Lieutenant Hall encouraged all those present to attend the Atlanta Symposium scheduled for October 2002.